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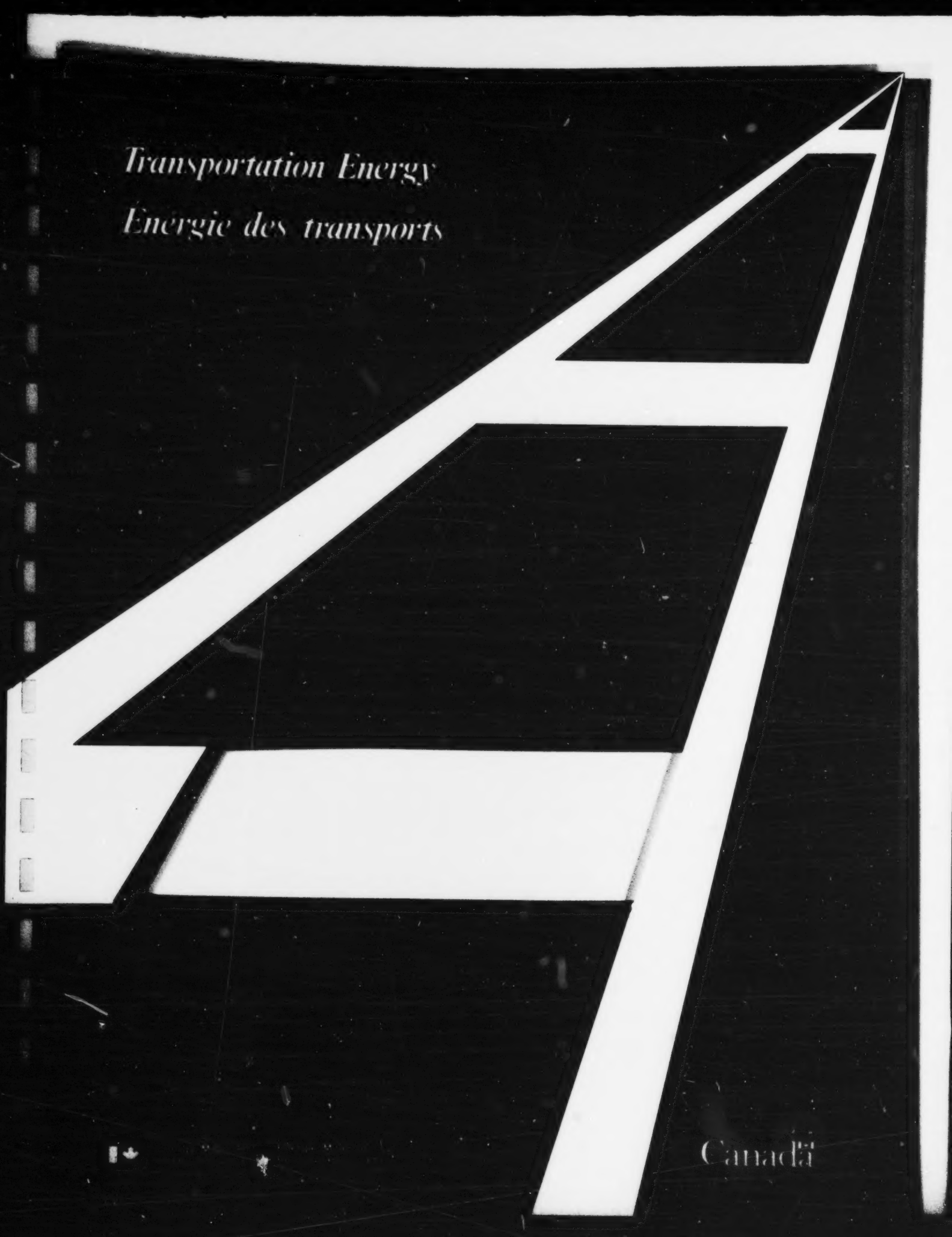

Canada

PROPANE VEHICLE CARBURETION
MARKET DEVELOPMENT
1980-1983

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DISCLAIMER

This study was carried out with the cooperation of the Department of Energy, Mines and Resources. However, the views expressed in the report are those of the author and do not necessarily reflect the views of the Department.

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INTRODUCTION

Propane is the first of the alternative transportation fuels to benefit from major federal and provincial incentives. It is an excellent carburetion fuel - safe, efficient, clean burning and non-polluting, and it is in good supply. Propane carburetion systems are based on proven technologies; Canada has had substantial experience in the operation of propane-powered vehicles, and a fuel distribution system has existed for years to serve propane's traditional markets. In addition, propane costs appreciably less than gasoline in most parts of the country.

Over the last three years propane use in vehicles has developed into an important new market for the propane industry, and propane has won widespread public acceptance as an alternative to gasoline.

This report reviews key aspects of this new propane carburetion market, focussing specifically on market growth, consumer characteristics, industry activity and growth, consumer reactions to propane, and finally propane supply and pricing - two of the most significant concerns affecting market growth. The report includes information derived from the following sources: Propane Vehicle Program data, telephone interviews with key industry persons, attitude studies carried out for the Program, and information generated within the Department.

I The Propane Vehicle Program

The Propane Vehicle Program was one of a number of incentives introduced by the federal government to encourage the substitution of alternative fuels for petroleum products. The government's objective was to direct at least one quarter of the current surplus of domestic production of propane into vehicle markets by 1985, which would involve approximately 90,000 propane vehicles and the displacement of 13,000 barrels a day of gasoline with 16,000 barrels a day of propane. The Program has now been in effect since June 9th, 1981, with applications being received from October, 1981.

Under the Propane Vehicle Program, a taxable contribution of $400 is available towards the cost of purchasing a propane-powered vehicle, or of converting a vehicle to a propane system. Dual fuel and private use vehicles were not eligible prior to April 1, 1984.

The program has generated a substantial data bank which includes information on regional distribution of vehicles, types of firms converting their fleets and types of vehicles being converted. There are also figures on the proportion of conversions done prior to purchase and after purchase, and on the amount of oil displaced. (See sample application, Appendix II).

1. Program Activity

An estimated 2,000 propane vehicles were on Canadian roads prior to October 1980, the official starting date of the program. As of July 31, 1983, applications had been received for 23,683 vehicles. (July figures are given as a basis of comparison since the industry survey described in Section II provided information to that date.) By February 29, 1984, a total of $13 million had been paid out in contributions under the Program, for just under 33,000 vehicles. Program figures to February 29, 1984 are shown on page 2, broken out by province.

Figure 1: Total Program Figures to February 29, 1984

Province	Applicants	Vehicles	% of Total No. of Vehicles
Maritimes	32	94	.3
Quebec	587	1318	4
Ontario	11028	19604	59.4
Manitoba	635	951	2.9
Saskatchewan	547	791	2.4
Alberta	3504	6293	19.1
B.C.	2300	3921	11.9
Yukon and N.W.T.	5	5	-
	18,638	32,977	100.0

Approximately 63% of the applications are received from the east (Ontario and Quebec) and 37% from the west (Prairies, Alberta and B.C.). The high percentage in Ontario is partially a factor of its large vehicle population relative to the rest of the country. However, propane has also received strong provincial support both through incentives and information programs, and this has been a significant factor in the growth of the Ontario propane market. Survey findings suggest that a very large proportion of propane vehicles in the east were single fuel and thus eligible for the Program, whereas in the west there is a substantial proportion of dual fuel vehicles which were not eligible. Thus, Program figures may reflect an inaccurate picture of regional distribution overall. The number of vehicles converted under the Program to February 29, 1984 is approximately 65% of the target number of vehicles for that time.

2. Market Profile

The Program data includes a breakdown of claimant types, as indicated in Figure 2. It should be noted that there is a slight margin of error in this data as applicants may misunderstand the claimant categories when filling out their application. The categories as listed on the application form are: taxi company, trucking company, manufacturer-wholesaler-retailer, contractor, service industry, sales (direct sales salesman), farm, municipal or other government authority, other.

Examples of the less specific categories follow:

Category	Examples
Trucking	transport, moving companies
Contractor	electrical contractors, plumbing, construction, courier companies
Service Industry	dry cleaners, florists, towing services
Municipal or other government authority	municipal transport commissions, regional school boards, municipal libraries (does not include federal or provincial government vehicles)
Other	professionals, non-profit organizations

Program statistics suggest that the manufacture-wholesale sector has taken advantage of the Program more than any other claimant class, followed by the service industries, trucking and taxi companies, contractors and local governments.

Figure 2:

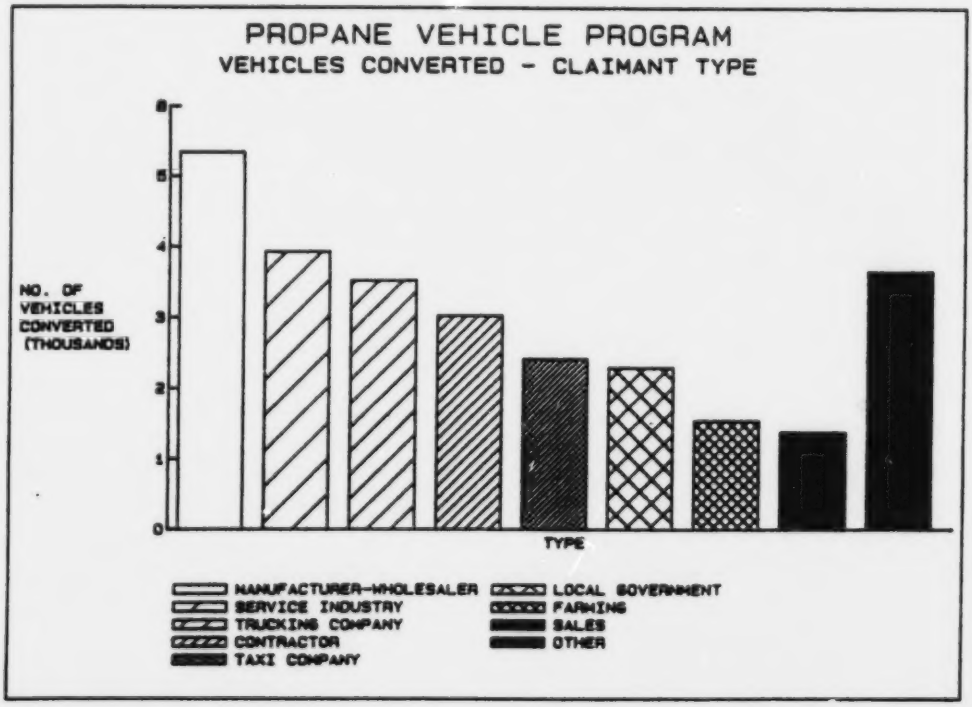


Figure 3:

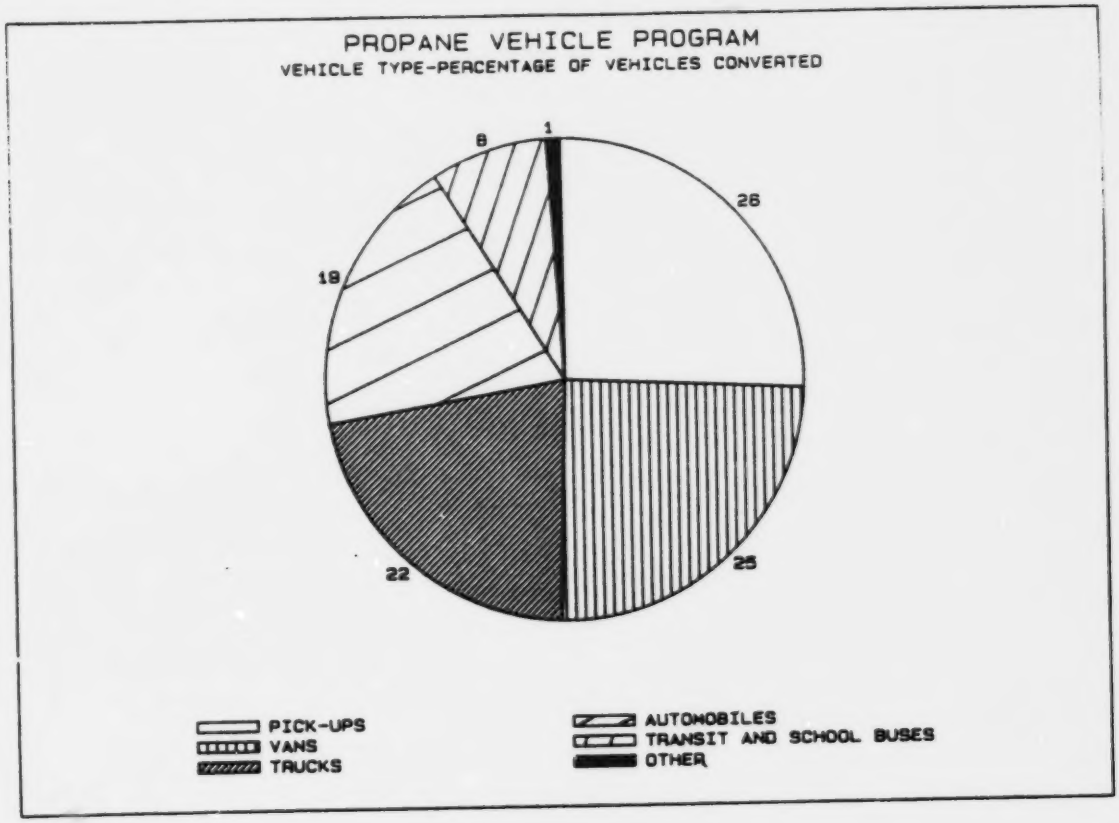


Figure 3 clearly indicates that pick-ups and vans are the vehicle types most often converted under the Program. Breaking these statistics down further, pick-ups account for the highest number of conversions (26%), followed by light vans under GVW 10,000 lbs.(22%), 8-cylinder automobiles (14%), buses (8%) and light trucks under GVW 10,000 lbs. (6%).

Figure 4 divides vehicle conversions according to whether the conversion was done before or after purchase of the vehicle, or if it was factory installed. This is of particular interest in Ontario where the 7% sales tax is reimbursed for new propane vehicles, and Figure 5 indicates that this category accounts for approximately 26% of the propane vehicles in Ontario, compared to 20% in the country as a whole.

Figure 4:

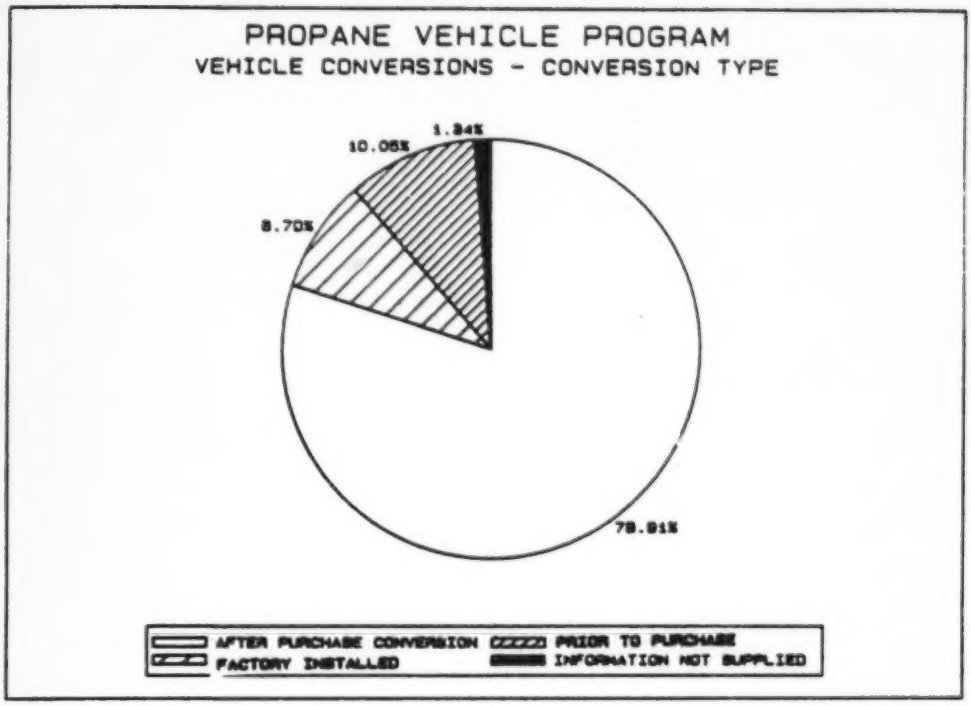
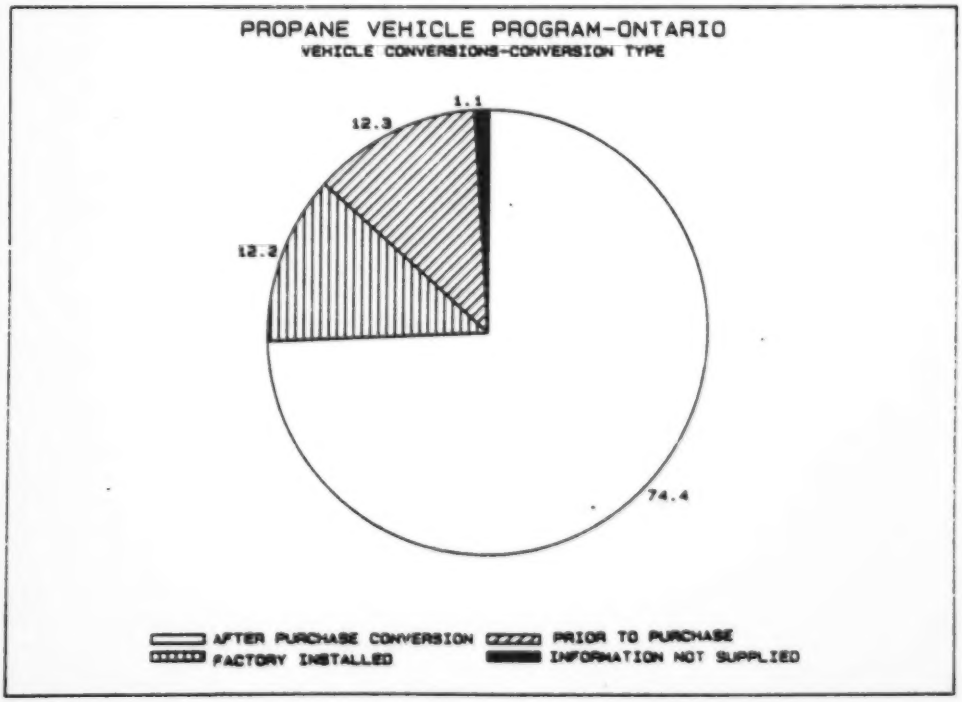


Figure 5:



II Propane Vehicle Population

Industry Survey

Statistics collected through the Propane Vehicle Program accurately reflect the number of commercial propane-dedicated vehicles receiving the $400 Program contribution, and this data is a good indicator of carburetion growth across the country. However, as non-commercial and dual fuel vehicles were not eligible under the Program, the total number of Canadian vehicles now operating on propane is unclear. In order to arrive at the most accurate estimate possible, an officer of the Propane Vehicle Program interviewed Canadian tank manufacturers and importers, as well as the major conversion companies and vehicle manufacturers regarding annual sales figures for propane vehicles. In all cases, statistics obtained were to July 31, 1983. By comparing the number of tanks with the number of conversions and manufactured vehicles, and by looking at the Program figures as well, a reasonable estimate can be made of the propane vehicle population overall.

One must, however, bear in mind that as there is no centralized systematic data acquisition in this area and as the method of record-keeping differs among companies, the results of this survey should be viewed as indicative rather than conclusive.

a) Tank Sales

Propane tank import statistics are unavailable from Industry, Trade and Commerce since all tanks and automotive equipment are classified under one category.

The survey suggests that total sales since 1979 number about 65,000. Figure 6 indicates tank sales figures by manufacturers and importers between 1979 and July, 1983.

Figure 6: Tank Sales Distribution Between 1979 and 1983

YEAR	CANADIAN MANUFACTURERS	CANADIAN IMPORTERS	TOTAL SALES PER YEAR
1983 (to July)	13,450	1,300	(14,750)
1982	15,100	9,700	24,800
1981	9,880	11,200	21,080
1980	no production	2,050	2,050
1979	350	1,450	1,800
TOTAL PER GROUP	38,980	25,700	64,480

It should be noted that the 1983 figures include January to July only, and one can infer that total 1983 sales will be approximately the same as 1982 sales or slightly higher. Following the massive growth from 1980 to 1981, tank sales appear to have levelled off.

The Table suggests that as of 1983, approximately 90% of the tanks sold are manufactured in Canada, and 10% are American-made, with a significant increase in Canadian manufacturing in 1982.

Approximately 60% of tank sales were in eastern Canada and 40% in western Canada.

b) Vehicle Manufacturers

The vehicle manufacturers are an increasingly important segment of the propane carburetion industry. With General Motors' recent entry into the field, all three major North American vehicle manufacturing companies are now producing propane vehicles. The manufacturers have introduced various models of propane vehicles, and the number of available engine sizes and models has been increasing. (See Appendix II for details).

Factory produced vehicles have several advantages over converted vehicles. Components are especially engineered for propane carburetion systems, resulting in better performance and efficiency compared to after market conversions. Quality control is better because of the stringent tests that each vehicle must undergo to meet federal regulatory standards. As a factory-installed propane carburetion system is generally less expensive than a post-factory conversion, it is an excellent value.

All vehicle manufacturers producing propane vehicles were contacted by the Program Office. A total of 5,753 propane vehicles were sold to August, 1983. Figure 7 illustrates that 1982 sales figures rose steeply over 1981 figures and 1983 saw a further increase of 35% (as of July).

Figure 7: Propane Vehicle Manufacturers' Sales Volumes

Vehicle Manufacturers	Sales Figures		
	1983 (as of July)	1982	1981
Chrysler	1254	546	0
Lada	1000	200	0
[1]Ford	661	850	300
International Harvester	180	500	250
[2]General Motors	12	0	0
	(3107)	2096	550

Notes:

1 Ford sold 425 trucks, in model year 1983, that had propane preparation packages on them and 236 factory optimized propane cars.

2 GM had just started producing propane trucks at the time of this report.

Note: Toyota had shipped 2 propane vehicles for research to the Manitoba Research Council but has no marketing plan for propane vehicles yet.

c) Conversion Centres

The results of the survey of the vehicle conversion industry were based on the ten companies with the largest share in overall conversion activity, as identified through the Propane Vehicle Program data. The six largest firms represented approximately 90% of the total conversions reported in the survey.

A similar survey had been done by the Propane Vehicle Program in the summer of 1982. Results indicated that from 1980 to May 1982 approximately 26,800 conversions had been carried out by the ten largest companies. By July 1983 a further 18,000 conversions had been carried out by the ten largest companies at that time (most of which were the same companies as in the previous survey).

Most companies offer a one-year guarantee on parts and labour, although there is some variation. Several of the companies surveyed specified one year or 20,000 kilometers, one company's guarantee was 1 year or 28,000 kilometers, and two others guaranteed parts for a year but labour for a shorter period. The average price quoted for a conversion was $1,400 ($300 for the installation and $1,100 for the equipment).

When asked about seasonal fluctuations in their business, most company managers stated that spring and fall are their busiest times.

The majority reported that servicing and maintaining propane vehicles is becoming a more and more important part of their work. Conversion company managers were questioned as to the most common problems their clients experienced with their propane vehicles, and these are referred to under Section IV.

Conclusion

For comparison purposes, Figure 8 summarizes the figures in this Section on tanks, conversions, vehicles manufactured, and the Propane Vehicle Program.

Figure 8	Total to July, 1983
Propane Vehicle Program - no. of conversions	25,683 (including 2,000 prior to Program)
No. of propane tanks sold - imported & Canadian	64,480
No. of conversions by 10 largest firms surveyed	46,800
No. of manufactured propane vehicles sold	5,753

By adding together the number of conversions reported during the survey and the number of propane vehicles sold by the vehicle manufacturers, and allowing for the small conversion companies which were not contacted, we can estimate that as of July 1983 there were approximately 55,000 vehicles operating on propane in Canada. The figure for tank sakes is understandably higher since it is not uncommon for more than one tank to be installed on a vehicle. The Program figures are substantially lower than industry figures and this is attributed primarily to the restricted eligibility criteria governing Program participation.

III Industrial Growth

Figures for tank sales, vehicles manufactured and conversions suggest an overall positive growth trend in the carburetion market. Tank sales rose sharply up to 1982 and appear to have levelled off somewhat since then. The number of 1983 models of propane vehicles sold will be substantially higher than the number of 1982 models. By July 1983, figures were already 35% higher than total 1982 figures. The conversion industry experienced a decline in the summer of 1983 compared with the previous year, as indicated by both the survey and Program Statistics. Those involved in the industry, however, did express optimism with regard to its future. The number of conversion centres, the number of propane fueling outlets, and the volume of propane fuel sales for vehicles are specific indicators of market growth. The following Figure summarizes activity in these three areas. It must be kept in mind that the figures for conversion centres include only those that have converted vehicles under the Propane Vehicle Program.

Figure 9

	1982	1983
Conversion Centres*	497	1357 (cumulative)
Propane Fueling Outlets**	2720	5400 (cumulative)
Propane Fuel Sold for Vehicle Use***	3.1 Petajoules	4.8 Petajoules (estimated)

* Includes only those centres that have converted vehicles under the Propane Vehicle Program.
** According to the Propane Gas Association of Canada.
*** 1 Petajoule = 2.25×10^6 barrels of propane

IV Consumer Reactions to Propane

The Fuels Programs Office of the Transportation Energy Division has had several studies carried out to ascertain consumer reactions to propane.

In March 1983 a survey was done of commercial fleet manager's impressions of conversion to propane. This was based on four sessions with fleet managers who had converted at least one vehicle, and four group interviews of fleet managers who had not converted any vehicles to propane. The sessions were held in Vancouver, Edmonton, Toronto, and Montreal.

Overall, almost all of the managers with direct conversion experience were pleased with the switch to propane. Satisfaction was due to perceived fuel economy and, to a lesser extent, claimed reductions in maintenance and increases in engine life. Participants stressed the importance of having drivers who respect the different behavioural characteristics of the propane vehicle. Many managers stated that they would be willing to convert other vehicles in their fleets, and any resistance to further conversion was related to fears that gasoline prices would fall and propane prices would rise. Many who intended to increase the number of propane vehicles in their fleet said that they would wait until vehicles had to be replaced and would buy propane powered ones at that time.

Reasons for not converting to propane among the managers who had not done so were: a lack of knowledge, perceptions that too few propane stations exist, fears of an imminent disappearance of the fuel price advantage of propane, the perceived high initial capital outlay, the safety factor, perceived performance and maintenance problems, the perceived large amount of space required for fuel tanks, and the limited range of a propane vehicle.

Participants from both groups cited a variety of sources of information about alternative fuels. Among the most prominent sources were: government promotions, articles and advertisements in the media (usually trade journals).

In a mail-out questionnaire survey carried out in August 1983 of companies that had converted their vehicles and those which had not, government information ranked highest among factors for making a final decision to convert. Those respondents who had converted vehicles, however, still claimed to be dissatisfied with the current level of technical information, and respondents who had not converted their vehicles ranked "not enough information" as second in their reasons.

In October 1983 a telephone survey was done of Propane Vehicle Program clients to measure the effectiveness of the delivery mechanisms and to identify possible improvements. According to the replies, 88% are satisfied with having converted to propane, the main reasons cited being "cheaper to operate" or "cheaper fuel", "better performance" and "less maintenance". The great majority of clients would convert again. Reasons cited by the few who would not convert again are: "less cost advantage now", unavailability of propane" and "lack of service".

When research was being done for the industry survey section of this report, and conversion company managers were questioned as to the problems their clients experienced with their propane vehicles, it became evident that problems are decreasing. Those noted by the managers are listed below in descending order of frequency:

- vehicles are not as fuel efficient as clients had hoped
- lack of knowledge by customers
- cold weather starting
- gauges inaccurate
- rust in tanks
- oil in propane
- leakage through hosing.

In many cases, adjustments can be made which would rectify the problem.

A recurring theme in all studies carried out is the importance of ensuring that drivers and vehicle owners are more fully informed as to the operation and maintenance of their propane vehicles.

V Propane Supply, Demand and Pricing

Both propane supply and price have been major concerns for consumers. This Section gives a brief overview of both issues.

Propane Supply and Demand

As indicated in Figure 10, the largest use for propane is as a fuel for residential and commercial heating and for industrial processes. Road transport use, while still relatively small, is growing and now accounts for approximately 10% of domestic propane use. Use of propane in enhanced oil recovery is expected to grow during the 1980's, peak in the early 1990's, and decline thereafter. Petrochemical use of propane will continue to expand and contract with petrochemical activity and in response to relative prices of competing feedstocks. As the petrochemical industry plans to use mainly butane and ethane, no major increases in petrochemical use of propane are expected. Slightly less than 50 percent of domestic propane production is exported, and exports are controlled by the National Energy Board.

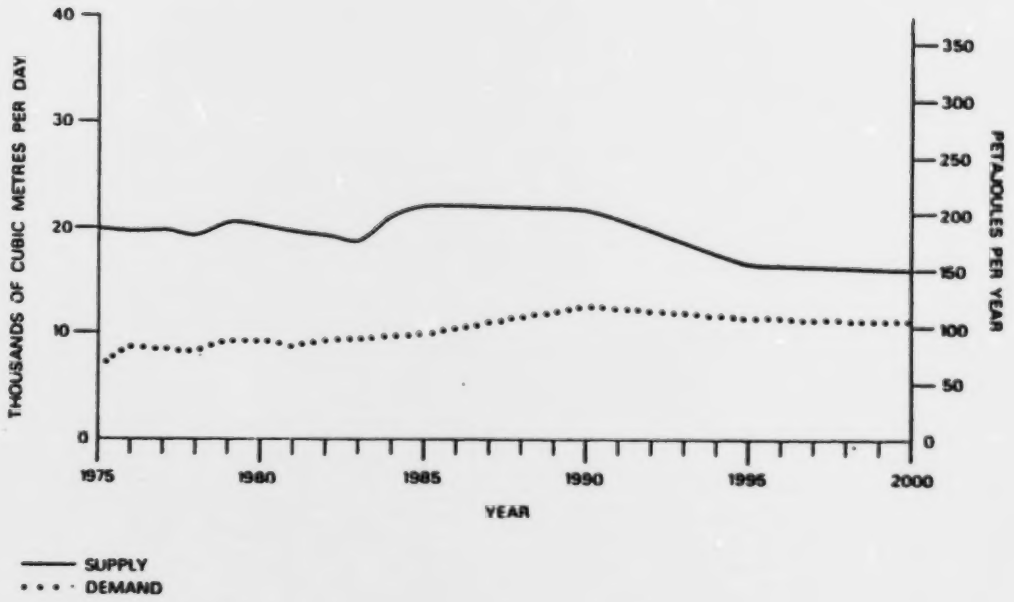
Figure 10: Propane Supply/Demand

Supply	Thousand Cubic Metres	Percent	Percent
Gas Plant Production	5 430	83	
Refinery Production	1 135	17	
Total Production	6 565	100	100
Demand			
Petrochemical Industry	486	14	
Enhanced Oil Recovery	670	19	
Residential, Commercial and Industrial Uses	2 033	57	
Road Transport	358	—	
Total Canadian Demand	3 547	100	54
Exports			
Amount Available for Export	3 018		46

Source: National Energy Board, 1983

As shown in Figure 11, Canada will have adequate supplies of propane to meet its requirements over the foreseeable future. Propane availability depends heavily on natural gas throughputs since natural gas is the source of 80% of Canadian propane production, and the current supply projection is based upon continued levels of natural gas sales into domestic and export markets. On the demand side, while growth is expected, especially for transportation purposes, it is expected to remain sufficiently below available supply to provide a comfortable cushion.

Figure 11: Canadian Propane Supply/Demand



Source: National Energy Board, 1983

Propane Pricing

The wholesale price of propane, unlike the price for crude oil and natural gas products, is not set by government agreement but by the industry. Producers appear to price it to follow the price of No. 2 fuel oil, still propane's major market competitor, with an upper limit established by export prices. As Alberta gas-based propane accounts for 80 percent of supply, wholesale prices thoughout Canada are set to meet competition out of Alberta. The federal government monitors both wholesale and retail prices across the country.

Control over the retail price of propane, however, resides with the province in which the propane is sold. While a number of provinces monitor the retail price of propane, only Nova Scotia regulates it.

The wholesale price of propane represents less than 50% of final retail prices in most cases, and transportation costs and levels of local competition both have a significant impact on pump price. As seen in Figure 12, the retail price includes wholesale price, Interprovincial Pipeline tariff, transportation costs, a federal energy tax and a retail margin.

It should be noted that the retail prices cited in this section are based on the posted prices established by propane suppliers, and not on actual pump prices at specific outlets. Thus the retail price figures used in these tables can differ significantly from the actual selling price in some locations.

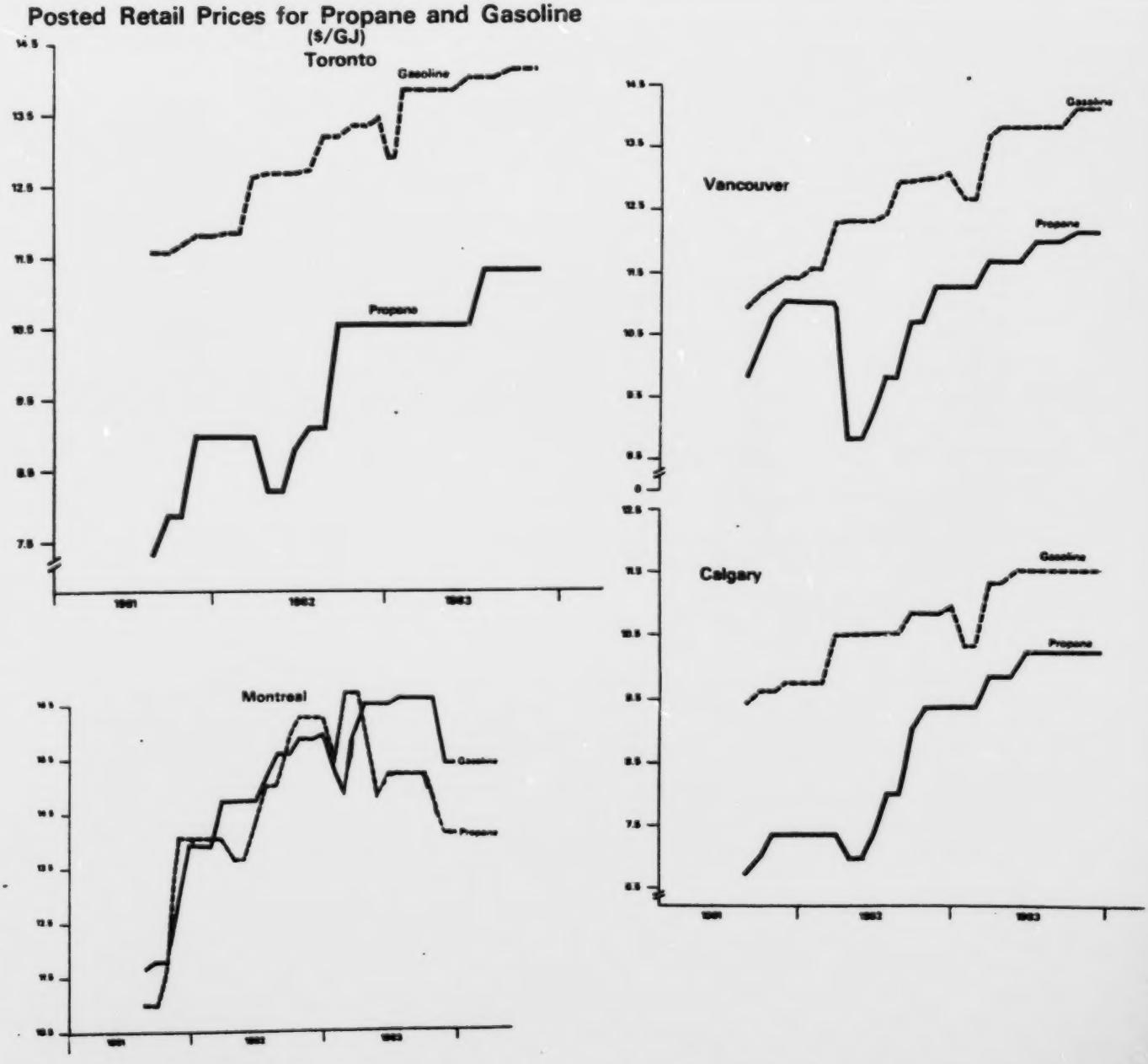
FIGURE 12: COMPOSITION OF RETAIL PRICES FOR PROPANE IN CALGARY AND PETERBOROUGH (¢/L)

Date	(1) Edmonton Wholesale	(2) IPPL Tariff	(3) Sarnia Fractionation (4-2-1)	(4) Sarnia Wholesale	(5) Transportation Sarnia-Peterborough	(6) Peterborough Retail	(7) Retail Margin (6-5-4)	(8) Calgary Retail	(9) Retail Margin (8-1)	(10) Federal Energy Taxes
JAN 80	6.49	.51	1.14	8.14	1.27	16.12	6.71	10.78	4.29	
APR 80	6.49	.51	1.14	8.14	1.30	17.55	8.11	10.78	4.29	
JULY 80	6.49	.51	1.14	8.14	1.33	18.43	8.96	10.78	4.29	
OCT 80	7.37	.51	1.25	9.13	1.36	18.43	7.94	12.21	4.84	
JAN 81	8.78	.53	1.31	10.62	1.39	19.31	7.30	14.20	5.42	0.71
APR 81	8.78	.53	1.31	10.62	1.42	20.20	8.16	14.20	5.42	0.71
JULY 81	9.43	.54	1.24	11.21	1.45	21.40	8.74	15.20	5.77	1.42
OCT 81	10.37	.63	1.05	12.27	1.48	22.70	8.97	16.80	6.23	1.42
JAN 82	10.60	.65	1.15	12.40	1.55	21.50	7.35	17.30	6.70	1.42
APR 82	7.4	.65	0.95	9.0	1.55	20.50	9.95	16.80	9.40	1.96
JULY 82	8.65	.68	1.52	10.85	1.55	22.80	10.40	19.40	10.75	1.96
OCT 82	11.2	.68	1.57	13.45	1.71	25.80	10.64	22.90	11.70	1.96
JAN 83	11.1	.73	1.67	13.5	1.71	25.80	10.64	22.90	11.80	1.96
APR 83	12.0	.73	1.67	14.4	1.71	26.8	10.69	24.1	12.10	1.50
JULY 83	12.9	.74	1.76	15.4	1.71	27.8	10.69	25.1	12.20	1.50
OCT 83	12.9	.74	1.76	15.4	1.88	27.8	10.52	25.1	12.20	0.74
JAN 84	12.6	.74	1.76	15.10	1.88	27.8	10.82	25.1	12.50	0.74

SOURCE: Posted wholesale prices, Dome Petroleum Ltd.; IPPL tariff, NEB; transportation to Peterborough, CN Rail; retail prices, EMR, Petroleum Business Economics.

Overall, the price spread between propane and gasoline has continued and in some areas actually widened, although gasoline price wars over the last year, along with price increases for propane, have led to a perception that the price advantage has diminished. In addition, of course, retail propane prices are sensitive to competition in each market. Figure 13 shows the pattern of gasoline/propane price fluctuations over the last three years for several major centres.

Figure 13



Finally, of course, there is significant variation in propane prices regionally, depending largely on the distance the fuel must be transported from source.

Figure 14: Comparison of Propane and Gasoline Pump Prices in Selected Canadian Cities

Third Quarter, 1983

(Cents per Litre)

	Propane		Gasoline[2,3,4]	
	Retail Price	Gasoline[1,4] Equivalent Price	Regular	Unleaded
Whitehorse	45.9	55.1	49.5	51.3
Yellowknife	33.2	39.8	49.1	50.9
Victoria	28.7	34.4	47.3	49.1
Vancouver	29.6	35.5	47.4	49.2
Edmonton	21.4	25.7	38.0	39.8
Calgary	24.4	29.3	38.7	40.5
Saskatoon	27.4	32.9	39.2	41.0
Regina	23.5	28.2	38.5	40.3
Winnipeg	27.7	33.3	45.3	47.1
London	23.8	28.6	41.9	44.3
Sudbury	31.0	37.2	46.0	48.4
Toronto	27.2	32.6	43.3	45.7
Ottawa	23.0	27.6	44.5	46.9
Montréal	35.6	42.7	50.9	53.6
Moncton	38.5	46.2	47.4	49.6
Halifax	39.7	47.6	48.9	50.7
Sydney	41.8	50.2	50.0	51.8
Charlottetown	42.6	51.1	51.6	53.8
St. John's	48.2	57.9	50.3	52.5

Source: E.M.R., Petroleum Product Marketing

1. Propane prices adjusted assuming a delivered energy equivalence of 1.2 litres of propane for each litre of gasoline. This represents the upper limit of the range. On average, it should be about 1.1 - 1.15. On an optimized factory-built vehicle it might be 1.0.
2. Excludes 1.5¢/l Federal Sales Tax which is refunded to commercial customers.
3. Prices at self-serve stations.
4. Average prices at selected outlets in each city. Actual prices at individual stations may be higher or lower.

As indicated in Figure 15, retail propane prices have been further assisted in Ontario, British Columbia and the Northwest Territories by remission of the provincial road tax. Federal taxes amount to less than 1¢ per litre.

A. Figure 15: Motor Vehicle Taxes on Propane by Province

(as of December 1, 1983)

	Propane		Gasoline			
			Regular		Unleaded	
	Amount ¢/l	Rate (%)	Amount ¢/l	Rate (%)	Amount ¢/l	Rate (%)
British Columbia[a,c]	-	-	7.63	20	7.63	20
Alberta	-	-	-	-	-	-
Saskatchewan	-	-	-	-	-	-
Manitoba	4.5	Fixed	7.5	Fixed	7.5	Fixed
Ontario[a]	-	-	7.9	20	8.3	20
Québec[a]	8.25	30	11.85	30	12.6	30
New Brunswick[a]	5.0	13	8.2	20	8.6	20
Nova Scotia[b]	8.8	20	8.8	20	8.8	20
Prince Edward Island[b]	9.8	22	9.8	22	9.8	22
Newfoundland	9.8	22	9.8	22	9.8	22
Yukon Territory	4.2	Fixed	4.2	Fixed	4.2	Fixed
N.W.T.	-		6.5	Fixed	6.5	Fixed

B. Federal Taxes on Propane

Natural Gas and Gas Liquids Tax (NGGLT)	0.38 ¢/L
Canadian Ownership Special Charge (COSC)	0.36
Federal Sales Tax (at the level of production)	
At Edmonton	0.08
At Sarnia	0.07
	0.89 ¢/L

a Ad Valorem.
b Ad Valorem based on the average of gasoline prices.
c An additional Urban Transit Tax of 0.95¢/l on retail gasoline sales is applicable in the Greater Vancouver Area.

Conclusion

In summary, Propane Vehicle Program statistics indicate that 18,600 applications for 33,000 vehicles were received to February 29, 1984. The manufacture-wholesale industry have been responsible for the largest proportion of vehicle conversions, and the most common types of vehicles converted are pick-ups and light vans. Approximately 80% of the vehicles included in Program statistics were converted after the vehicle was purchased.

The industry survey revealed that an approximate total of 65,000 propane tanks had been sold in Canada to the end of July, 1983. Tank sales are levelling off and the majority are now manufactured in Canada. The vehicle manufacturers have an increasingly important role in the development of the propane vehicle industry, and the three major North American companies are now participating. Propane vehicle sales to the end of August 1983 totalled 5800. The ten largest conversion companies identified through Program data did 46,800 conversions to the end of July, 1983. On the basis of all of the foregoing information, it was concluded that as of July 1983 there were approximately 55,000 vehicles operating on propane in Canada.

The three industrial growth factors that were considered show a substantial increase from 1982 to 1983. During that period the number of conversion centres in Canada (according to Program data) and the number of fueling outlets appear to have doubled, and the amount of propane sold for vehicle use increased by 55%. In view of the apparent levelling off in the number of conversions done and of tanks sold during this period, one may assume that growing confidence in the overall propane carburetion market led to the increasing numbers of conversion centres and fueling outlets.

Several studies have been carried out to ascertain consumer reactions to propane. The majority of those who have converted vehicles are pleased with their savings, and would make the same conversion decision again. Among the main reasons given for not converting vehicles were: lack of knowledge, perceived lack of fueling outlets and fears of a disappearance of the fuel price advantage of propane.

To summarize the propane supply situation, forecasts indicate that Canada will have adequate supplies of propane to meet its requirements for the forseeable future. On the demand side, while growth is expected, especially for transportation purposes, it is expected to remain sufficiently below available supply to provide a comfortable cushion.

The wholesale price of propane is set by the industry, and appears to be in accordance with the price for number 2 fuel oil, with an upper limit established by export prices. The wholesale price of propane represents less than 50% of final retail prices in most cases, and transportation costs and levels of local competition both have a significant impact on pump price. Overall, the price spread between propane and gasoline has continued and in some areas actually widened, although gasoline price wars over the last year, along with price increases for propane, have led to a perception that the price advantage has diminished. Retail propane prices have been further assisted in Ontario, British Columbia and the Northwest Territories by remission of the provincial road tax.

APPENDIX I

Propane Options Available from Vehicle Manufacturers

The following is a description of the various models of propane vehicles available from each of the vehicle manufacturers.

Ford

Ford offers the propane engine option on their LTD and Marquis models at an additional cost of approximately $1,200.00.

Ford also offers a 370 and 429 cubic inch medium to heavy truck in the F, L and LN series at a cost of $1,200.00 to $1,850.00. They will produce a propane preparation package on many of their other trucks.

Chrysler

Chrysler offers trucks, vans and cars with a propane option direct from the factory.

Chrysler is now offering propane for their 2.2 litre 4 cylinder engines. They are offering Caravelle and Diplomat propane cars as well as 14 models of trucks from 1/2 ton to 1 ton with the 5.2 litre engine. The approximate additional cost for cars is $1,400.00, and for light trucks $1,350.00.

International Harvester

IHC offers mid-range trucks in the Motor Vehicle Manufacturers' Association GVWR Groups 6, 7, 8 with V-345 and V-392 engines with a propane option direct from the factory. The propane option increases the retail price of the vehicles by approximately $1,400.00.

Lada

Lada offers a dual fuel, propane-gasoline installation on their 1450 cc and 1600 cc engines as well as in the 1600 Sedan, the four wheel drive "NIVA" and the Signet. The additional cost for all available models is $1,200.00.

General Motors

GM has recently started to offer propane vehicles produced at the factory and finished by Kerr Industries with a full GM warranty. This includes a 350 cubic inch conventional 2 wheel drive 3/4 ton pick-up truck and their 1 ton van models. Approximate additional cost for the propane option is $1,400.00.

APPENDIX II

PROPANE VEHICLE PROGRAM Sample Application

APPLICANT INFORMATION

IDENTIFICATION NUMBER

MAKE CHEQUE PAYABLE TO: [ ] ORGANIZATION [ ] INDIVIDUAL

NAME OF ORGANIZATION OR INDIVIDUAL | GIVEN NAME

NUMBER, STREET (APT. NO., P.O. BOX OR RR NO.)

CITY, TOWN | PROVINCE | POSTAL CODE

PERSON TO CONTACT IN THIS APPLICATION | AREA CODE | TEL. NUMBER | EXT.

TYPE OF BUSINESS. ONE BOX MUST BE CHECKED (✓) BELOW

1 [ ] TAXI COMPANY
2 [ ] PUBLIC TRANSIT COMPANY
3 [ ] MANUFACTURER, WHOLESALER OR TRADER
4 [ ] CONTRACTOR
5 [ ] SERVICE INDUSTRY
6 [ ] SALES (DIRECT SALES SALESMAN)
7 [ ] FARM
8 [ ] MUNICIPAL OR OTHER GOVERNMENT AUTHORITY
9 [ ] OTHER (SPECIFY) _____

FLEET INFORMATION

HOW MANY VEHICLES ARE IN YOUR FLEET

HOW MANY ADDITIONAL PROPANE VEHICLES DO YOU PLAN TO PURCHASE/CONVERT IN THE NEXT 12 MONTHS?

HAVE YOU MADE A PREVIOUS APPLICATION TO THIS PROGRAM? YES [ ] NO [ ]

VEHICLE TYPE

TYPE	DESCRIPTION	TYPE	DESCRIPTION	TYPE	DESCRIPTION
A	AUTOMOBILE - 4 CYLINDER (CLASS 1)	G	VAN OVER 10 000 LBS GVW (CLASS 10)	M	TRUCK UNDER 33 000 LBS GVW (CLASS 9)
B	AUTOMOBILE - 6 CYLINDER (CLASS 1)	H	TRUCK UNDER 10 000 LBS GVW (CLASS 10)	N	TRUCK OVER 33 000 LBS GVW (CLASS 9)
C	AUTOMOBILE - 8 CYLINDER (CLASS 1)	I	TRUCK UNDER 10 000 LBS GVW (CLASS 10)	O	OTHER VEHICLE (CLASS 10)
D	PICK-UP TRUCK UNDER 8 000 LBS GVW (CLASS 1)	J	TRUCK UNDER 10 000 LBS GVW (CLASS 10)	P	TRANSIT BUS
E	PICK-UP TRUCK OVER 8 000 LBS GVW (CLASS 10)	K	TRUCK UNDER 10 000 LBS GVW (CLASS 10)	Q	SCHOOL BUS
F	VAN UNDER 10 000 LBS GVW (CLASS 10)	L	TRUCK UNDER 26 000 LBS GVW (CLASS 10)	R	UNLICENSED FARM VEHICLE
				S	OTHER

GVW - GROSS VEHICLE WEIGHT

CONVERSION TYPE

1 CONVERSION 2 CONVERTED PRIOR TO PURCHASE 3 FACTORY INSTALLED

VEHICLE INFORMATION

	VEHICLE IDENTIFICATION NUMBER (VIN) OR FRAME NUMBER	PLATE NUMBER	PROVINCE	VEHICLE TYPE	MODEL YEAR	FUEL USED ANNUALLY (LITRES)	CONVERSION TYPE	CONVERSION COSTS: EQUIPMENT	CONVERSION COSTS: LABOUR	TOTAL COST OF CONVERSION	GRANT CLAIMED (MAX. $4000.00 EACH)	
1												1
2												2
3												3
4												4
5												5
6												6
7												7
8												8
9												9
10												10
11												11
12												12
13												13
14												14
15												15
	TOTAL NO. OF VEHICLES						TOTALS ▶					

APPLICANT'S DECLARATION

The applicant and or his appointed representative accepts the conditions of participation and certifies that

- I am an eligible claimant
- The vehicles claimed are eligible vehicles
- I have not received a grant or contribution from this or any other Federal program for the work covered in this application
- I understand that this is a taxable grant
- I understand that grants paid are subject to audit for three years. I will retain records for this purpose and will permit such audit
- I consent to the Government of Canada or its agent verifying any statement and inspecting any work done under this application
- I understand that false statements may lead to prosecution under the criminal code of Canada or civil action may be taken for repayment
- I waive all claims against the Government of Canada, its employees, agents and independent contractors or any way connected with or arising out of the conversion in respect of which this application is made and will indemnify the Government of Canada, its employees, agents and independent contractors from third party claims, if any, in respect thereto
- I certify that all information given on this application and the attached annexes is true and accurate

APPLICANT'S SIGNATURE | YEAR | MONTH | DAY

APPLICATION IS VOID WITHOUT AUTHORIZED SIGNATURE

PRINTED NAME AND OFFICE OF LICENSE SIGNATORY | ENGLISH [ ] FRENCH [ ]

EMR USE ONLY

YEAR | MONTH | DAY | AMOUNT | REMARKS | APPROVED BY